

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (original): A semiconductor integrated circuit (IC) package comprising:

a substrate including at least one electrical ground plane and having a plurality solder balls formed on a surface thereof, said solder balls including a set of thermal solder balls positioned near the perimeter of the package;

an integrated circuit die mounted to the substrate such that the die is electrically connected with some of the solder balls; and

a heat spreader mounted on the package such that the heat spreader is in thermal communication with the die and also in thermal communication with the set of thermal solder balls positioned near the perimeter of the package thereby enabling a portion of the heat generated by the die to be dissipated from the die through the heat spreader into the set of thermal solder balls.

Claim 2 (currently amended): The IC package of Claim 1 wherein the set of thermal solder balls is electrically connected to said at least one electrical ground plane; and

wherein the heat spreader, the at least one electrical ground plane, and the set of thermal solder balls are arranged so that heat generated by the die can be dissipated from the die through the heat spreader into the at least one electrical ground plane and into the set of thermal solder balls.

Claim 3 (currently amended): The IC package of Claim 2 wherein the heat spreader electrically connected to the at least one ground plane operates to reduce electrical noise generated by the package.

Claim 4 (currently amended): The IC package of Claim 3 wherein the at least one heat spreader is connected to the thermal solder balls using conductive mounting pegs and wherein the at least one heat spreader forms part of a electromagnetic shield that reduces the overall electrical noise generated by the package.

Claim 5 (currently amended): The IC package of Claim 3 wherein the heat spreader is connected to the thermal solder balls using conductive mounting pegs and wherein the heat spreader, conductive mounting pegs, and the thermal solder balls form, in combination, part of an electromagnetic shield that reduces the overall electrical noise generated by the package.

Claim 6 (original): The IC package of Claim 1 wherein the package comprises a ball grid array package.

Claim 7 (cancelled).

Claim 8 (original): The IC package of Claim 2 wherein the package comprises a ball grid array package.

Claim 9 (cancelled).

Claim 10 (withdrawn): A system comprising:

- a system board having a system ground;
- an integrated circuit package including

- a substrate having at least one ground line and a plurality of solder balls formed on a surface thereof, the solder balls including a set of thermal solder balls formed near the edges of the substrate,

- an integrated circuit die electrically connected to the ground line and to at least some of the solder balls,

- a heat spreader mounted in thermal communication with the integrated circuit die and electrically connected to the ground line and electrically connected to the thermal solder balls such that the ground line, and heat spreader operate to reduce electrical noise generated by the package; and

- the package mounted to the system board using the solder balls such that the package ground line is electrically connected with the system ground and such that at least some of the heat produced by the die is dissipated by the heat spreader through the ground line into the thermal solder balls and into the system board.

Claim 11 (withdrawn): The IC package of Claim 10 wherein the package comprises a ball grid array package.

Claim 12 (withdrawn): The IC package of Claim 10 wherein the package comprises a flip chip package.

Claim 13 (withdrawn): The IC package of Claim 10 wherein the ground line of the substrate comprises a ground plane.

Claim 14 (withdrawn): The IC package of Claim 13 wherein the combination of the electrically connected ground plane and heat spreader operate in combination as a electromagnetic shield to reduce the amount of electrical noise produced by the package.

Claim 15 (withdrawn): A computer incorporating the system of Claim 10.

Claim 16 (currently amended): A semiconductor integrated circuit (IC) package comprising:

a substrate including at least one electrical ground plane and having a plurality solder balls formed on a surface thereof, said solder balls including a set of thermal solder balls electrically connected with a ground plane and positioned near the perimeter of the package;

an integrated circuit die mounted to the substrate such that the die is electrically connected with some of the solder balls;

a heat spreader mounted on the package with conductive mounting pegs that are electrically connected with at least one of the at least one ground plane and such that the heat spreader is in thermal communication with the die and in thermal communication with the set of thermal solder balls thereby enabling a portion of the heat generated by the die to be dissipated from the die through the heat spreader into the set of thermal solder balls; and

the combination of the electrically connected at least one heat spreader, ground plane, and conductive mounting pegs operating together as a electromagnetic shield that reduces the amount of electrical noise of the package.

Claim 17 (original): An electronic device incorporating the IC package of Claim 16.

Claim 18 (original): An electronic device incorporating the IC package of Claim 16 wherein the electronic device comprises a computer **device**.

Claim 19 (new): A semiconductor integrated circuit (IC) package comprising:

a substrate including at least one electrical ground plane and having a plurality solder balls formed on a back surface thereof, said solder balls including a set of thermal solder balls positioned near the perimeter of the package;

an integrated circuit die mounted to the substrate such that the die is electrically connected with some of the solder balls; and

a heat spreader mounted on the package using conductive mounting pegs that pass through the substrate such that the heat spreader is in thermal communication with the die and such that the conductive mounting pegs contact leads formed on the back surface of the substrate and extend outward from the middle of the substrate to the set of thermal solder balls positioned near the perimeter of the package thereby enabling a portion of the heat generated by the die to be dissipated from the die through the heat spreader into the set of thermal solder balls.

Claim 20 (new): The IC package of Claim 19 wherein the heat spreader electrically connected to the at least one ground plane operates to reduce electrical noise generated by the package.

Claim 21 (new): The IC package of Claim 20 wherein the combination of the heat spreader, conductive mounting pegs, and at least one ground plane forms part of a electromagnetic shield that reduces the overall electrical noise generated by the package.

Claim 22 (new): The IC package of Claim 19 wherein the package comprises a ball grid array package.